Northeastern U.S. Going through Dry Spell

Drought is in the news. It has been dry for months in the Northeast U.S. and drought continues in the West, although conditions have improved out west this year compared to the last few years. In many cases, though, the prudent use of water storage reservoirs and regional operating agreements have shielded millions of Americans from any direct impacts from the lack of rain.

We "declare" droughts when natural or managed water systems do not provide enough water to meet established human and environmental uses because of shortfalls in rain or snowfall or streamflow, but what really makes a water shortage a "drought" is where you get your water. Farms without irrigation can suffer a drought if they do not receive enough rain over a few weeks or months – especially if the shortage occurs during the growing season. Those who get their water from surface or groundwater storage, though, may be able to go much longer without rain. It is not unusual for rain-fed farms to suffer drought damages while city water users in the same region have plenty of water. Such was the case in the Washington, DC area in 1999, and it is true again this year.

The latest National Weather Service Climate Prediction Center U.S. Drought Monitor Map (26 Feb 02) shows portions of the country in "extreme" (worse than "severe") drought, including the Washington, DC area. The map shows the New York City area in "severe" drought.

For information on specific areas or on how the Corps of Engineers prepares for drought, click on these links:

New York City & Vicinity

Philadelphia & Delaware River Basin

Washington Metro Area

Central Pennsylvania - Susquehanna River Basin

Planning for Drought

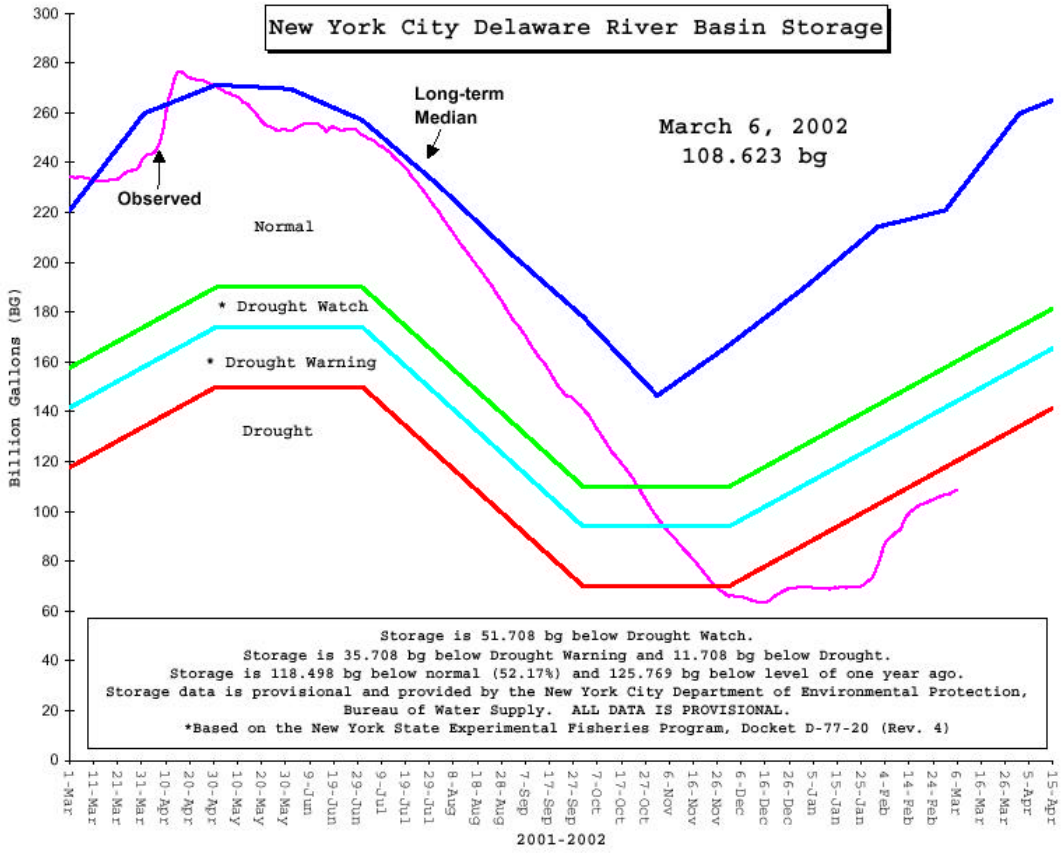
Economic Impacts of Drought

Role of the U.S. Army Corps of Engineers During Drought

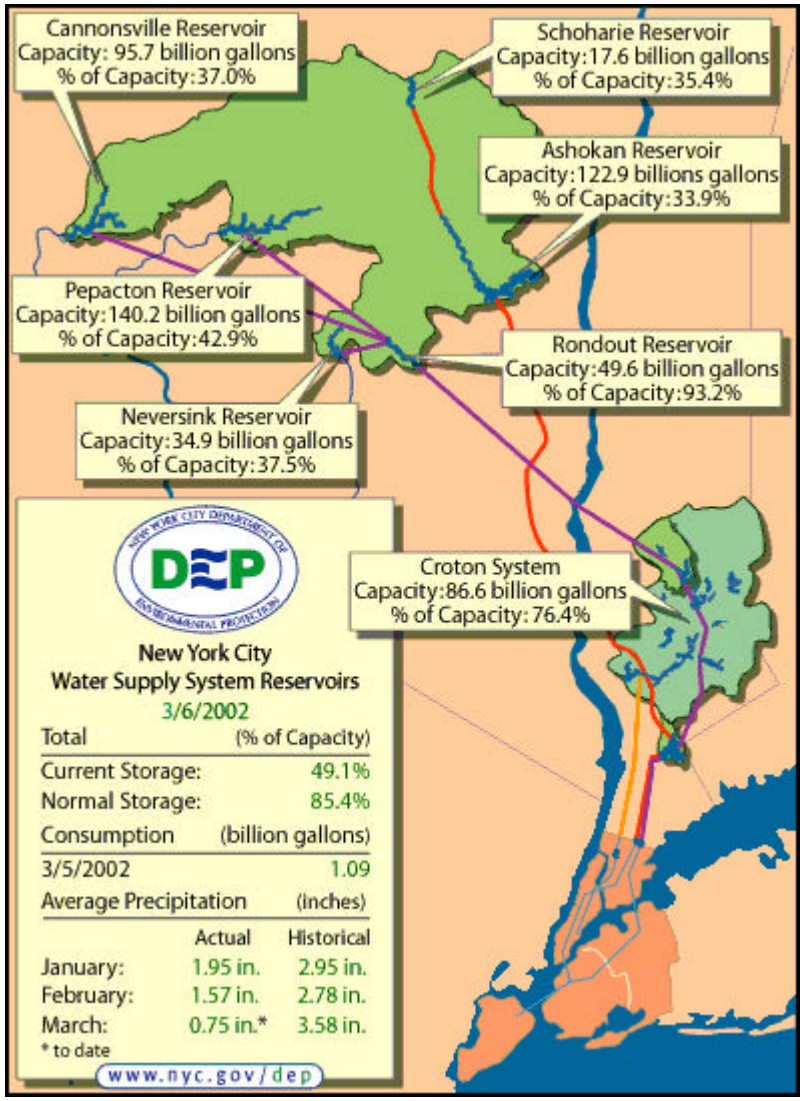
New York City & Vicinity

New York City had half its normal precipitation from September 2001 through February 2002. According to the National Drought Atlas, a guide to the severity, frequency and duration of droughts for the continental U.S. measured in terms of precipitation and streamflow; weather that brings 62% of normal precipitation or less occurs only one year out of 50; so New York suffered a very rare drought in terms of precipitation shortfall. .

On March 6, 2002, New York City reservoir storage on the Delaware was 108 billion gallons, about half the normal amount and well below drought levels (see graph, below)



The current New York City status is “Drought Warning” (worse than Drought Watch, better than Drought Emergency), signifying that there is less than a 33% probability that either the Catskill or Delaware Systems will fill by June 1.



The graphic on the left shows that Croton reservoir is much closer to full than other New York City reservoirs.

Philadelphia & Delaware River Basin

The last five months also have been very dry in the Philadelphia area, central and southern New Jersey and Northern Delaware. Southern Delaware has not been as hard hit by the prolonged dry spell.

In December 2001, the Delaware River Basin Commission (DRBC) declared a drought emergency in the 13,539 square mile watershed draining portions of New York State, Pennsylvania, New Jersey and Delaware. Under emergency order, the Commission can call for releases from federal, state, and privately-owned reservoirs to bolster flows in the Delaware River and tributary streams. The Commission is requesting the Corps of Engineers to retain storage in the F.E. Walter Reservoir and provide releases at the Commission's request. During the 1999 drought, the Corps raised water levels for additional water storage at this reservoir to help address severe water shortages in the Delaware River Basin

Washington Metro Area

Precipitation has also been very scant in the Washington, DC area, but local homeowners using the large water suppliers around Washington have plenty of water, thanks to storage reservoirs in the Potomac Basin and an innovative "Low Flow Allocation agreement" among Fairfax County, VA, Montgomery County, MD and Washington. DC. At the present time, two of the major suppliers of water to the Potomac River, Jennings Randolph and Little Seneca Creek reservoirs are full. The Occoquan reservoir, the main source of water of Northern Virginia residents is about 80 percent full.

The Interstate Commission on the Potomac River Basin reported on March 5, 2002 that:

> *In the Potomac River near Washington DC, flow is currently several times greater than demands plus the minimum environmental flow recommendation of 100 million gallons per day (mgd). The streamflow record suggests that the probability of water supply releases from the Potomac reservoirs is not likely (less than 1% chance) through July 1.*

That means not only is there more than enough water in the river to satisfy municipal and environmental needs, there is not even much chance that we will have to draw reservoirs down this summer, when the effects of drought are usually most pronounced.

In the 1999 drought, the Corps released 3 of the 13.2 billion gallons of water from Jennings Randolph to relieve water shortages and satisfy in-stream flow needs in the Potomac River Basin for about 25 days. In the event of a severe drought, it is estimated that Jennings Randolph could provide up to 6 billion gallons of water to meet similar needs.

Central Pennsylvania - Susquehanna River Basin

The Susquehanna River Basin Commission (SRBC) has called for continued voluntary water conservation throughout the Susquehanna Basin as drought conditions persist, including record low groundwater levels for this time of the year in the lower Susquehanna region. Virtually the entire Susquehanna Basin, including parts of New York, Pennsylvania and Maryland are covered by drought watch and warning declarations. A drought watch calls for voluntary 5 to 10 percent reduction in water use and a drought warning calls for 10 to 15 percent voluntary reduction. On February 12th, the Governor of Pennsylvania issued a drought emergency for portions of both the Susquehanna and Delaware Basins.

SRBC already owns more than 30,000 acre-feet of water storage at two Corps reservoirs in Pennsylvania.

Planning for Drought

The National Drought Policy Commission, recommended that the U.S.:

- Favor preparedness over insurance, insurance over relief and incentives over regulation;

- Set research priorities based on the potential of the results to reduce drought impacts; and
- Coordinate the delivery of federal services through cooperation with state and local governments, as well as other non-federal entities.

Preparedness means developing and updating a plan to respond to droughts. There are three time frames for planning drought response. The longest are "strategic" measures - such as water supply structures, water law and plumbing codes. More immediate are "tactical" measures, like water rationing, developed in advance to respond to expected short-term water deficits.

"Emergency" measures are implemented as an *ad hoc* response to conditions that are too specific or rare to warrant the development of standing plans. Even emergency response can be planned to some extent. For example, a state may know that it has dozens of small isolated communities that may lose their water supplies in time of drought, and can develop general plans to help whichever community is affected by the next drought. These plans can include working with regulatory agencies to speed approval of pipelines needed to carry water, and the provision of water tankers or pipeline to standby for emergency use.

Unfortunately, most drought plans are developed right after a drought and are outmoded by the time the next drought comes. The best way to avoid this is to exercise the plan, like a fire drill. The Washington area was the first to conduct drought exercises, and does to this day.

Economic impacts of drought

The economic impact of drought is sometimes difficult to isolate for a variety or reasons. Droughts sometimes go on for so long that drought impacts may be difficult to separate from recessions.

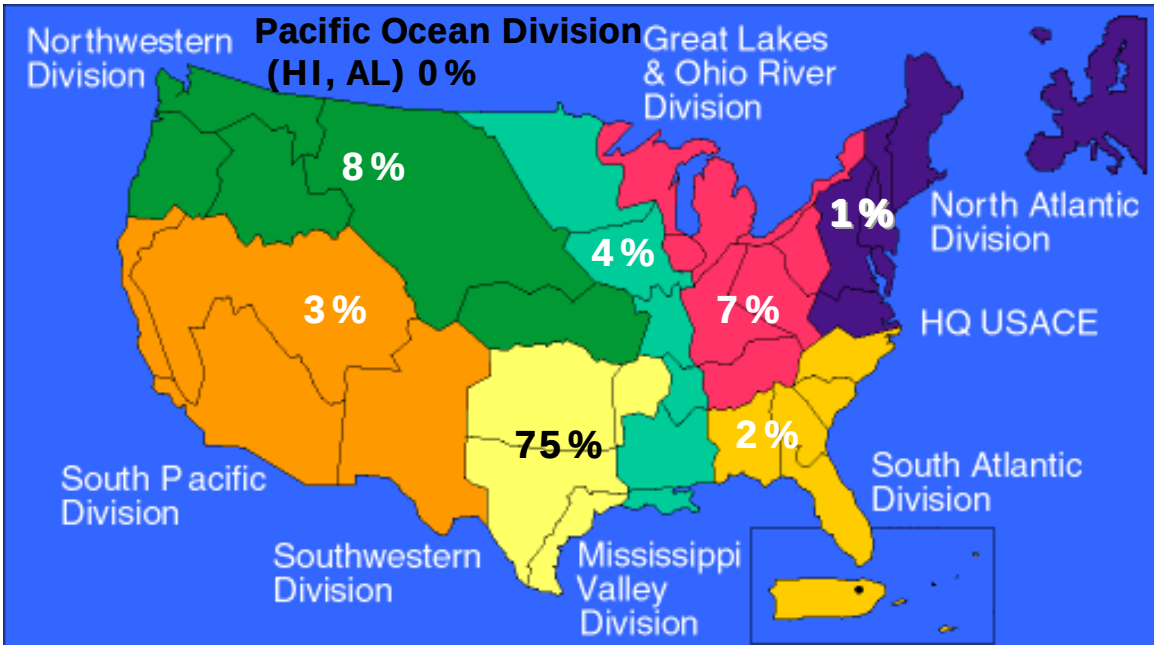
A Corps review Federal governments emergency response costs indicates the Federal government spends an average of at least a half-billion dollars per year on drought relief.

Role of the U.S Army Corps of Engineers During Droughts

The U.S. Army Corps of Engineers has several responsibilities when it comes to drought. Its reservoirs store water so that it is available in dry periods for the environment, for navigation, for use cities and industry, for agriculture, for hydropower and for recreation. Every Corps reservoir has a drought contingency plan. Corps reservoirs now reserve:

- 9.5 million acre-feet of storage space for cities and industry in 117 reservoirs
- 57 million acre-feet of irrigation storage in 50 reservoirs in the West

The Corps water supply storage volume would cover Texas in 5 inches of water. The distribution of municipal storage is shown on the map below.



The Corps is also a source of engineering and planning expertise on the drought. The Corps National Drought Study (1989-1993) produced the National Drought Atlas, a 48-state guide to the severity, frequency and duration of droughts measured in terms of precipitation and streamflow. The same study produced a Report to Congress on water management during drought (download the report) and a guidebook (download the guide) on how to manage water during drought. The method in that report was tested and improved in case studies around the country.

In 2000, the Corps participated in the National Drought Policy Commission, and helped shape recommended changes in the way farm and water polices and law affect the damage droughts cause. And the Corps "Water Supply Handbook" (download the report) is an encyclopedic reference to water supply and the Corps, including drought management.

The Corps also has some limited authority to provide emergency help during drought, when other sources of assistance are not available. A directory of Federal drought assistance programs, including the Corps can be found at http://www.iwr.usace.army.mil/iwr/Drought/FedDrghtProgs.htm